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NAVAL WAR COLLEGE  
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**SEA CONTROL: THE ROLE OF  
LAND-BASED AIR POWER**

by

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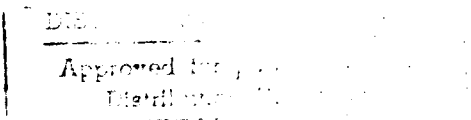
A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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Abstract of

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Unlike land war, war at sea may be decided by air power. Since World War II, carrier air power, has been the primary instrument of national policy and has been unopposed in establishing sea control. There is no asset in the world today as effective at projecting power as the carrier battle group (CVBG). However, modern weapons, particularly cruise missiles and the SSN, have become increasingly more potent and increased the vulnerability of the aircraft carrier. Land-based aircraft are not subject to the same threats as surface ships, carriers included. Land-based air is also a responsive force which can quickly engage the enemy with considerable firepower. In order to afford a CVBG the greatest margin of safety and the best opportunity for mission success, the CINC must employ long-range land-based air to diminish the threat prior to introducing the carrier into a conflict.



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# **SEA CONTROL: THE ROLE OF LAND-BASED AIR POWER**

## **CHAPTER I**

### **INTRODUCTION**

In "Desert Storm", air power, employed as a single entity, was again proven to be indecisive. There is little doubt that air power played a significant role and that without the devastating effects of the most intensive and accurate air campaign in history, allied ground casualties would have been extreme, the war would have been lengthened and the outcome might have been less certain. However, despite the remarkable success of air attacks on enemy industrial targets, command and control facilities, supply lines, troop concentrations and numerous other targets, warfare objectives in "Desert Storm" followed the consistent historical pattern and were guided by the necessity to dislodge the enemy and occupy the disputed territory; requirements which may only be satisfied by the action of ground forces. Whether from a strategic or tactical platform, conventional air power remains a supporting element in the AirLand Battle concept.

The concept of air power in the sea control regime is considerably more complex than that of land warfare. Sea control may involve destruction of the enemy naval force entirely, it may necessitate protection of sea lines of communication or operating areas or it may require the denial of enemy access to areas of the sea as a medium for commerce, transportation or to exert influence or to wage war. In none of these circumstances does an absolute requirement exist for occupation of a position to achieve the objective. Presence

alone, does not constitute victory nor is it necessary to sustain a presence after the enemy has been sufficiently crippled so as to preclude continued offensive operations and challenges to friendly forces at sea. It is much more significant to control or deny access to an oceanic area or route than it is to control the waters on which they are carried. In his introduction to Rosinski's The Development of Naval Thought, B. Mitchell Simpson III states,

"... Control of the sea does not mean occupation of fixed points, as on land, because that is not possible. Control in this sense means the capability of moving across the sea without significant hindrance or opposition and the capability to prevent an enemy from so moving."<sup>1</sup>

Since control and not occupation is the primary objective of naval warfare, the method of attainment invites a much broader choice of options. In a very general sense, Mahan's concept that the tactical objective of naval warfare, to destroy or neutralize the enemy fleet, could be accomplished by a climactic battle at sea, blockade in port or a distant blockade in hope that the enemy will sortie and engage in the desired climactic battle,<sup>2</sup> are still evident in modern U.S. naval strategy. In the early 1980's the U.S. Navy adopted "The Maritime Strategy" based on a forward engagement of the Soviet Fleet, and in operations in the Mediterranean in 1986, submarines, surface units and aircraft kept the Libyans contained in port and immediately attacked any units which ventured out. If it can be successfully executed, this type of forward offensive which contains an enemy, minimizes the opportunity for enemy dispersal (and the attendant problems of large area search) and also provides buffers for vital sea lane protection. Certainly, other more subtle and sophisticated options exist today, particularly within the spheres of deterrence and presence,

but when hostile action is necessary, the technology and ranges of modern weapons systems demand swift, forward, decisive engagement of the enemy fleet.

Supplied with a wide variety of assets, the CINC is faced with selection of forces appropriate for achieving his objectives and the best sequencing of these forces based on relative effectiveness and vulnerability. This has proven to be an issue of much debate within the United States military for the past seventy years and is no less so today. It is an issue which has broad political ramifications, inspires considerable interservice competition and encompasses future force structure as well as employment considerations. This paper will discuss employment considerations involved in the execution of naval operations based on the thesis that, the war at sea strike employing long-range air power is the dominant factor in offensive maritime operations.

## **CHAPTER II**

### **THE EVOLUTION OF AIR POWER AT SEA**

Air power has proven to be an effective force in actions at sea as well as on land. In the Pacific campaign of World War II, carrier based aircraft were the key elements in offensive naval strategy and were the decisive factors in virtually every naval engagement. This was "...symbolized in the Battle of the Coral Sea in which not a naval gun was fired though great losses were sustained by air attack on both sides."<sup>1</sup> Although the Pacific theatre received fewer long range aircraft because of the preeminence of European requirements, and the overall effectiveness was limited by available airfields, range and the proximity to the battle area, land-based bombers and patrol aircraft were also widely employed against naval targets with great success. Table I on the following page illustrates the relative contribution of air power to naval operations in the Pacific.



TABLE I  
JAPANESE WARSHIP AND MERCHANT LOSSES BY CAUSE,  
1941-1945

WARSHIPS		MERCHANTS	
CAUSES	TONNAGE	CAUSES	TONNAGE
Naval aircraft	745,000	Submarines	4,774,000
Naval acft & other agents	167,000	Naval aircraft	1,543,000
Submarines	540,000	Naval act & other agents	192,000
Surface ships	278,000	AAF aircraft	668,000
AAF aircraft & mines	73,000	AAF mines	551,000
All other	157,000	Combinations of above	840,000

Source: R.J. Overy, The Air War, 1939-1945, New York: Stein and Day, 1981, p. 96.

Although not achieved against a maritime nation, the results in the Atlantic also demonstrate the effectiveness of air power against naval targets. But, unlike the carrier action in the Pacific, the successes in the Atlantic were primarily due to land-based attack. Naval escort carriers were not available until March 1943 , and these were typically employed in antisubmarine operations in gaps in the land-based air coverage.<sup>2</sup> Aside from the campaign against the U boats and an intensive, albeit unsuccessful, action against the Tirpitz, carrier air activity was confined to the Mediterranean. The following summary includes all allied statistics for the Atlantic with the exception of the U.S.S.R.

**TABLE II**  
**VESSELS SUNK, CAPTURED OR DESTROYED IN THE ATLANTIC**  
**1939-1945**

WARSHIPS		MERCHANTS	
CAUSES	TONNAGE	CAUSES	TONNAGE
Aircraft	342,966	Aircraft	941,198
Surface ships	186,839	Mines	660,553
Mines	160,730	Submarines	318,387
Submarines	41,203	Surface ships	302,998
Other	69,702	Other	363,897

Source: S.W. Roskill, The War at Sea, 1939-1945, London: Her Majesty's Stationery Office, 1961, pp. 473, 475.

In World War II, Billy Mitchell's vision became reality. The evolution of warfare at sea had "...dethroned the Battleship as queen of national power"<sup>3</sup> in favor of the greater agility and lethality of aircraft. Sea power was conveyed by air and the Supercarrier became the most imposing and powerful seagoing vessel in history. In every conflict since WWII, it has been the aircraft carrier which was first on the scene to establish sea control and then to project power. In each of the over 50 actions since 1980,<sup>4</sup> U.S. naval presence, and particularly the carrier battle group, has been so overwhelming and dominating it remained virtually unopposed. In fact, the only serious challenges to the aircraft carrier in the last fifty years have been rooted in political and fiscal concerns. In 1948 and 1949 competition between the Air Force and the Navy over the strategic bombing mission and the B-36, indirectly cost the Navy a Chief of Naval Operations and stopped the construction of the first

Supercarrier, The United States,<sup>5</sup> but the House Armed Services Committee Report issued 1 march, 1950 sustained Naval Aviation by stating "Intercontinental strategic bombing is not synonymous with air power. The Air Force is not synonymous with the Nation's military air power. Military air power consists of Air Force, Navy and Marine Corps air power..."<sup>6</sup> Although it retained a strategic strike mission, and its airwing contained aircraft specifically designed for strategic strike, (A-3, A-5) the carrier was clearly acknowledged as the primary instrument of power projection. This new role was affirmed in a 1957 speech by Admiral Felt, then Vice Chief of Naval Operations:

"There is a tendency to associate the Forrestal class carriers and the nuclear powered carrier with nuclear general war retaliation. Actually attack carriers are an economical and ready means of applying U.S. tactical air power to limited war situations. They can be moved quickly on the seas around the peripheral trouble spots. They avoid the thorny and involved problems of bases on foreign soil."<sup>7</sup>

At this stage, early in the Cold War, American control of the seas was so absolute, discussion focused not on how to wage a campaign to gain control of the sea but rather how to best utilize the carrier to threaten an adversary's land mass. This mastery was to continue through the sixties, but as with the rest of the U.S. military, the first challenges to the previous superiority became obvious as the Viet Nam War drew to a close. CDR. Hans Garde of the Royal Danish Navy wrote in 1975, "...the Soviet Union has been able to establish a naval presence of impressive dimensions around the globe, and maritime problems have again come to public attention."<sup>8</sup>

The Soviets more than any other nation, recognized and feared the menace of the aircraft carrier and in addition to a general expansion of the surface fleet, produced two

types of weapons systems in great quantities which disputed the carrier's claim to the world's oceans; the nuclear submarine and the cruise missile. Submarines had been a potential threat even during WWII, but because they were slow and relatively easy to detect when they surfaced periodically to charge batteries, they were easy to avoid if not kill. The nuclear powered submarine is nearly as fast as a carrier and can remain submerged and undetected indefinitely. The cruise missile is fast, difficult to detect, and can be launched by any platform from extended ranges with either a nuclear or conventional warhead. The carrier is still the most intimidating and effective means of power projection, but in any encounter against the Soviets or one of their clients, an opposed transit must be anticipated.

## **CHAPTER III**

### **VALUE VERSUS VULNERABILITY**

The carrier's foremost attribute, the ability to move rapidly over the sea to project power, has forced the Soviets to introduce effective counters, and ultimately exposed its vulnerability to the three dimensions of modern naval warfare. Because it moves on the surface of the ocean, the carrier is exposed to attack from not only surface ships but also submarines and a host of airborne platforms. To defend against all three of these elements is a costly proposition and detracts from the amount of strike capability available for the primary mission, power projection. The carrier must arrive on scene capable of launching air strikes as a show of force, to support amphibious operations, or to support other strategic objectives. A carrier which must first establish sea control and, in the process, sustains mission degrading damage has been, in effect, defeated in a power projection mission.

There are those who would dismiss an aircraft carrier's vulnerability due to its size or the number of defensive weapons employed throughout a battle group, as Mr Lehman did in his 1978 writing in support of aircraft carriers,<sup>1</sup> but the lessons of history clearly dispute such optimism. Regardless of the depth or intensity of the Anti Submarine Warfare defenses, 100 percent probability of detection is not attainable against a modern nuclear submarine or under certain conditions against a conventionally powered submarine. One torpedo may not sink an aircraft carrier but the most likely firing would be four to six torpedoes and that number would, at the very least, severely hamper maneuverability and

probably do enough damage to sink it. Similarly, the cruise missile has proven to be extremely difficult to defeat.

CDR. Bernard Wegener of the German Navy writes:

"The task of hitting an aerial target approaching head-on, with a target area of 0.025m<sup>2</sup> to 0.635m<sup>2</sup> and a length between 2.3 and 9.5m, poses a difficult challenge to guns, defensive missiles and fire control systems. This difficulty is increased by multipath propagation of radar pulses... (and) programmed maneuvers of the approaching ASM (anti shipping missile)."<sup>2</sup>

Even assuming sufficient defensive capability existed to defeat a single missile, missile attacks would be launched in such numbers as to ensure defensive systems would be overloaded and some would get through. CDR. Wegener concludes:

"No defensive system available today can guarantee a naval vessel 100 percent survival against ASMs. Every defensive system can be defeated if the aggressor deploys enough ASMs to ensure destruction."<sup>3</sup>

The Falklands War proved the vulnerability of surface ships to air attack. A total of eleven warships were attacked, two by missiles the rest by bombs; many of those damaged were mission losses and four were eventually sunk.<sup>4</sup> Certainly, many of the defensive systems employed by the British were not as advanced as systems available today on U.S. vessels but neither were the Argentines employing sophisticated weapons or tactics. Defeating an intense air attack, whether against aircraft or air, surface or subsurface launched cruise missiles, demands superior weapons, great tactical skill and lots of luck. The Exocet attack on the Stark in May 1987, certainly illustrates the tragic results of even the slightest complacency in the anti-air environment.

Another argument for the invulnerability of the aircraft carrier, is the amount of punishment it can withstand and still function. Four catapults, a large deck area to allow for aircraft movement around damaged areas and superb firefighting and damage control training have enhanced carrier mission survivability, but the Forrestal incident in 1967, which was caused by an A-4 drop tank igniting, killed 145 and destroyed or damaged fifty-nine of seventy-one aircraft on board.<sup>5</sup> Whether an aircraft carrier can remain effective after a torpedo or cruise missile attack depends on many factors which no one can predict. If a carrier is attacked it is possible it will be hit and if it is hit some damage will result. In light of the value of the aircraft carrier in the power projection role, can we afford to risk even a mission loss from surface or subsurface units in a battle for sea control? The answer is unequivocally no, particularly when an alternative method of establishing sea control is available as a precursor to the carrier's mission.

## **CHAPTER IV**

### **AIR POWER ALTERNATIVES FOR SEA CONTROL**

The multi dimensional aspects of modern naval warfare provide significant problems for defenses. Because they are accessible from all three dimensions, surface ships, including aircraft carriers, must be able to negate air, surface and subsurface attacks. Although much better protected by the operating environment, even submarines must contend with attacks in three dimensions. One method for reducing the severe disadvantages of exposure to all of an enemy's weapons, is to pursue the offensive and initiate the first strike to nullify the enemy capability in one or more areas. A carrier could, for instance, launch an air strike against an enemy surface action group (SAG) before the gap in relative ranges was closed by the SAG. If this action were successful, the battle group would only have to contend with the air and submarine threat and could concentrate efforts against each sequentially. However, reliance on first strike as a method of protection and conceivably survival, requires infallible intelligence and perfect timing and tactics. Such luxuries are not always available and anything less than total success would alert the adversary and threaten the carrier and any losses incurred in the action would cause a degradation for any subsequent power projection mission.

A simpler and safer option for disrupting an enemy's capabilities is to peel away the mutually supporting layers of strategic or tactical defenses utilizing long-range, land-based aircraft. Aircraft are not vulnerable to submarines or cruise missiles and modern standoff weapons eliminate the need to close within the range of defensive anti-air weapons.



Land-based aircraft have a strike capability very similar to that of a carrier and are perfectly suited to eliminating forces which may otherwise deplete a carrier's striking power. However, employing land-based aircraft for sea control is not a plan absent of any flaws. Forward bases in close proximity to the theatre of operations reduce flight time, enhance coordination, improve turn-around time and ensure there will be no gaps in area coverage, but U.S. access to bases around the world is rapidly being reduced and usage of the remaining bases as, Mr Lehman points out, is subject to the political whims of the host government and targeting by the enemy.<sup>1</sup>

Convenient air bases are desirable for any conflict but the lack of a nearby base does not represent an insurmountable problem. During the Falklands War, British Vulcans from Ascension Island, bombed the Stanley airport, a flight of over 3500nm one way, and Nimrods, hastily modified for inflight refueling, routinely conducted patrols from Ascension Island for surveillance between the Falklands and the mainland.<sup>2</sup> Extremely long range missions are also nothing new to The U.S. Strategic Air Command, which has continuously trained for strikes against the Russian mainland, and recently conducted missions against Iraq from bases great distances away. Unfortunately, the primary maritime patrol aircraft of the U.S. and numerous other nations, the P-3, has no inflight refueling capability and would not be able to participate in a strike beyond approximately 2000nm from the closest operating base.

A second problem associated with land-based sea control is the possibility of encountering enemy fighter aircraft. Large, relatively slow, long-range aircraft are no match for fighters and despite the sophistication of airborne anti-missile defenses, any operations

which encountered large numbers of enemy fighters would have a reduced chance of success. On the other hand, since the enemy is restricted by the small radius of action of its fighter protection (1135nm for the longest range Soviet fighter the MIG-31 deployed primarily in the Pacific Fleet),<sup>3</sup> it would be severely limited in its maneuver space and tactical options. If an offensive strike was essential to the strategic objectives of the operation, then other measures such as Tomahawk strikes, would have to be pursued to neutralize fighter coverage. Regardless of the strike platform, this sequence would have to be implemented in any area where significant fighter coverage could be expected, to ensure success of the mission.

In any conflict where sea control is a prerequisite to the ultimate objective, a sequential strategy should be employed which includes the following:

1. Contain seagoing forces within port or confined geographic areas.
2. Neutralize enemy counter air forces.
3. Employ land-based air assets to destroy any surface forces which deploy.
4. Employ land-based air assets to conduct ASW operations and sanitize the intended area of operations.
5. Introduce amphibious/ strike forces into the area of operations.

In each of the first four steps listed above, long-range, land-based air assets minimize the associated risks of loss and set the stage for uncontested offensive capability by the most effective power projection platforms.

Soviets.<sup>1</sup> Forward deployed U.S. air ASW assets, augmented by British, Dutch, Canadian and German aircraft, erect a broad ASW barrier to contain the Soviet SSNs attempting to surge southward.

The position of the Soviet battle group is closely monitored by U.S. and Norwegian intelligence assets, and planning is commenced for a long-range air strike on the Soviets shortly after they pass 070 degrees north in their southbound transit, (approximately H+32). At H+28, U.S. SSNs patrolling in the Norwegian Sea are directed to launch conventional SLCM attacks against the two large airfields near Murmansk and several smaller dispersal fields in the area suspected of long-range fighter activity. At H+30, two inverse synthetic aperture radar (ISAR) equipped P-3s arrive in the vicinity of the Soviet battle group to initially conduct surveillance for electronic emissions. Thirty minutes prior to the scheduled time on target, the P-3s employ ISAR to establish a surface plot and provide position information at five minute intervals for the attack aircraft using NATO Surface Picture (SURPIC) reporting procedures.<sup>2</sup> At H+32 the Soviets are under a concentrated attack of more than 100 Harpoon cruise missiles launched from 10 P-3s, 5 B-52s and 5 Nimrods in four different sectors. A second strike is already airborne to commence an attack as soon as retargeting information, based on battle damage assessment from the first strike is forwarded.

When the Soviet surface forces are sufficiently attritted, an intensive ASW campaign begins. By the time the U.S. battle force arrives, the Soviet threat has been considerably reduced and amphibious and strike operations can proceed unimpeded.

Third World conflicts offer a similar tactical problem on a much smaller scale. It is imperative that any hostile surface craft or submarine be eliminated as a threat, prior to

commencing amphibious, land or air operations. The value of an aircraft carrier, both as an instrument of power projection and as an image of American strength and resolve is too high to allow it to be damaged or even put at risk by any lesser power.

Recent engagements have demonstrated the need and the necessity of confining enemy naval forces. In the Falklands War, the British using primarily SSNs and patrol aircraft, completely excluded the Argentinean Navy from entering into the operating area. In the Gulf of Sidra in 1986, U.S. SSNs kept the Libyan Foxtrot submarines confined in port so the Carrier Force could have complete freedom of action. Preliminary reports of naval operations in the Persian Gulf during "Dessert Storm" indicate any Iraqi Naval craft attempting to enter the gulf were quickly detected and identified by maritime patrol aircraft and destroyed by available tactical air or helicopter assets.

Hostile submarines and surface craft which are able to sortie and lie in wait in shallows and straits for the carrier to steam past, pose a significant threat which cannot be ignored, but unfortunately, is a capability which is constantly improving.

## CHAPTER VI

### CONCLUSION

Sea control initiated by land-based aircraft, is an absolute necessity for any conflict involving naval power projection. The submarine enjoys a distinct advantage in warfare and air, surface and subsurface cruise missiles are constantly being improved for greater range, accuracy and payload. Surface ships can't hide and, when they are detected, survival in the face of modern weapons is questionable. Air Commodore Jasjit Singh of the Indian Navy writes: "...air power may be expected to play an increasingly dominant and nearly pervasive role in surface warfare, almost completely subordinating the conduct of land and sea warfare to the exercise of air power."<sup>1</sup>

Aircraft carriers are surface ships and though well defended and structurally capable of absorbing massive damage, they are still vulnerable to the same threats as all other surface ships. Aircraft carriers are also extremely valuable to any U.S. power projection scenario both as an instrument of devastating firepower and as a symbol of American strength, attributes which make them the singular most highly prized target for any adversary. The CINC's first consideration after he decides to employ an aircraft carrier for power projection should be, "What can I do to ensure success?" The answer should be, "Launch your land-based aircraft, now!"

## NOTES

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